Fall 9-1-2007

C&I 402.01: Teaching Mathematics K-8

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C & I 402 Teaching Mathematics K-8

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"Technology is an essential tool for teaching and learning mathematics effectively; it extends the mathematics that can be taught and enhances students' learning."
NCTM Position Statement on Technology

Overview This course is an opportunity to build a conceptual and pedagogical framework for mathematics education, K-8. Throughout the course, the student will get acquainted with elementary and middle school mathematics topics, methods, and materials. In addition to content, other areas to be explored include: curriculum changes, current research in mathematics education, professional organizations, including the National Council of Teachers of Mathematics (NCTM), School Science and Mathematics (SSMA), and other professional organizations.

Goals of this course:

1. Gain a good view of mathematics
2. Learn about and how to construct problem-based, student- centered approaches to learning.
3. Mathematics is intrinsically rewarding to learn and to teach!

Student Objectives

1. Learn NCTM Standards (2000) for teaching of mathematics K-8. They will become acquainted with topics within these standards, especially the Focal Points (2007) for their field grade level and an appropriate methodology for different development levels.
2. Develop worthwhile tasks centered on the six Professional Standards for Teaching Mathematics of the NCTM Standards (1991) using a variety of teaching methods and/or materials.
3. Become aware of the different learning styles, individual, multicultural and gender differences in children and make applications to their lessons.
4. Learn different ways to assess and evaluate students' progress in a mathematics curriculum. We will evaluate ways to assess and discuss different rubrics.
5. Become acquainted with professional organizations and various research activities that support and influence the teaching of mathematics. (NCTM, SSMA, MCTM, MEA/MFT)

Required: Van De Walle, J. (2007) *Elementary and middle school mathematics: Teaching developmentally*. White Plains, NY: Pearson Education, Inc. http://wps.ablongman.com/ab_vandewalle_math_6

Bay-Williams, J. M. (2007). *Field Experience Guide: Resources for Teachers of Elementary and Middle School Mathematics*. White Plains, NY: Pearson Education, Inc.

Equithe, R. (2007) *Teach like your hair's on fire.* New York: The Columbia Press

Welchman-Tischler, R. (no date). *Start with Manipulatives*. Vernon Hills, IL: ETA/Cuisenaire.

On reserve in TRC:

Texas Instruments (2005). *Uncovering Mathematics with Manipulatives and Calculators.* Jacksonville, TX: Author. (There are 2 levels: K-2 and 2-6)

Assignments

Attendance/Participation (10%): Attendance and participation is very important on a daily basis. Journal entries will be included as your participation grade. Many pertinent ideas are discussed and covered only in class. Being present and *actively participating* are aspects of your grade. Communication in class is important. If you need to miss, please email or leave a message, this is **a professional courtesy. No more than 2 absences will be permitted.** If you are absent more than 2 times, you may drop a letter grade. Please be professional in your presence and interactions on campus. You are building a professional profile now, let us all collect the data you want to project!

Teaching I (15%): Prepare a hands-on, minds-on lesson (over 2 days) introducing a concept using a problem based lesson you will teach in your field placement. You learn by following up with the students. *The DRAFT will be reviewed* by me. Sign up for a conference. Afterwards, set up a time to be observed by your mentor. *Reflect as a team* or you may choose to reflect individually, using the Professional Standards. See appendix B in text. Final Lesson Plan & Reflection due **October 16.**

Quizzes (20%) There will be 2 quizzes early in the semester. Please read the assigned chapters from the Van De Walle text.

Mathematical Manipulative Project (M & M) (10%) As a team of 4, you will develop a problem-based activity (teaching a mathematical concept) with a manipulative from your kit. Watch a video from the list below. Then we will split out and individuals will present in small groups. Then, as a group, write a brief 3-5 page paper. Your paper will address teaching in a conceptual manner, a specific NCTM content standard, how your method compares with the same concept presented in an elementary text compares to Van De Walle text describes how to teach the concept. How would you address cultural differences in the teaching of this? Especially address Native American and/or any minority represented in your class. Get to know your class before you write this paper.
Presentations start Sept 20, paper due by 27th.

Marilyn Burns Videos

VT 04265	Base-Ten Blocks
VT 04266	Color Tiles
VT 04267	Cuisenaire Rods
VT 04268	Geoboards
VT 04269	Pattern Blocks

Kay Toliver Videos

Fractions
The Counting Principle
Decimals
Volume

Blog Postings (15%) Throughout the semester you will be asked to explore mathematics on the web and blog. This will involve outside class time. The results will be posted on-line so the all can read and learn from the postings. See the Postings info for details mentioned below.

Assessment of Mathematical Teaching (AMaTe) (15%): Work with a student who is struggling with some mathematical concept. Meet with me once with your partner (if your students are in the same class). Let's talk about what the student is struggling with. I can provide more individual comments and you more help for the student. Then, you will interview the student about perspectives on teaching and learning math. Write a summary of student's comments and reflection of the sessions. See handout for more info. **Due Nov 1.**

Integrated Unit (15%): Adhere to Unit Outline given in seminar. Any questions, please ask. **Due Dec 3rd.**

Evaluation Grading Scale

A	95-100
A-	92-94
B+	90-91
B	87-89
B-	84-86
C+	81-83
C	78-80
C-	76-77
D	68-75
F	<68

All written assignments must be printed with a letter quality printer and are due at class time of the assigned day. **Late assignments are not accepted.**

Course grade "A-" corresponds to 93%. To achieve higher one must go "Above & beyond." This means 7 % will be awarded for elements that exceed minimum requirements or "exceptional achievement." For each formal assignment, examples will be given.

Graduate Students- Select and research a mathematics educational issue of interest: use of calculators, ethnomathematics, same gender classes. Prepare a 20-minute powerpoint (ppt) that supports a class discussion you lead! PPT should include: clear introduction, well-organized progression of topic, at least 3 points for a class discussion; purposeful connections to the mathematics education community; recommendations; annotated bibliography of resources. This project is worth an additional 40 points; but follow the same grading system as listed below (95-100% A; 92-94% A-, etc.) Please notify me by the end of the second week of class to discuss your interest in the graduate increment.

All students must practice **Academic Honesty**. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://www.umt.edu/SA/VPSA/index.cfm/page/1321

Evacuation Action Plans

Primary Route: Nearest exit
Outdoor Rally Points South of Ed Bldg…at least 300 Feet from the building!!
Indoor Rally Point: McGill Hall
Always assume the emergency is real. Take valuables, building may be closed for some time!

Informative WEBSITES

http://wps.ablongman.com/ab_vandewalle_math_6 This supports this course & your text.

http://del.icio.us/Georgia.Cobbs: my favorite websites!

C & I 402 Dynamic Calendar
Fall 2007

Week	Topic	Readings, Assignments
1 Aug 28	Course Overview: Activities & Standards	Journal in class daily Chap 1
Aug 30	Activities & Standards	Chap 2 & 3
2 Sept 4	Reform in mathematics, NCTM Standards	Review for quiz
Sept 6	Kamaii video, types of teaching Toliver Tape: Welcome to Mathematics	**Quiz 1: Chap 1-3**
3 Sept 11	Types of texts: **Meet in Mansfield Level 2**	Chapters 4
Sept 13	Field Info; prep for MM; build Jet Toy (SAE)	Chapters 5
4 Sept 18	Equity Teaching, Lesson Planning	Chapter 7
Sept 20	**M & M project presentations:** Base Ten; C-Rods Assessment http://www.4teachers.org/	Grade Billy's test, Ch 6
5 Sept 25	**M & M project presentations:** Pattern Blks, C-tiles	**Quiz 2: Ch 4-7**
Sept 27	**M & M project presentations:** Volume & Geoboards	**M & M Due**
6 Oct 2	Fraction Article posted in Blackboard Technology: Websites, CBLs & calculators	**Fraction Article** Read & Discuss in class
Oct 4	No formal class, bring draft of lesson plan	Sign up with me
7 Oct 9	**TEACHING IN THE FIELD**	Sign up with mentor
Oct 11	**TEACHING IN THE FIELD**	
8 Oct 16	**Virus: Integrated theme**	**Teaching I Due**
Oct 18	**MEA/MFT Belgrade , MT**	**Attend MEA!!**
9 Oct 23	AMaTE & Technology: Websites, CBLs & calculators	Chapter 8
Oct 25	Ethnomathematics	**Resources!**
10 Oct 30	Literature & Mathematics http://sci.tamucc.edu/%7Eeyoung/literature.html	Various books!
Nov 1	Literature & Mathematics	**AMaTe Due**
11 Nov 6	Algebra Lab Gear	
Nov 8	Lab Gear	
12 Nov 13	**TEACHING IN THE FIELD**	Sign up with mentor
Nov 15	**TEACHING IN THE FIELD**	
13 Nov 20	**TEACHING IN THE FIELD**	*Technology lesson in*
Nov 22	**Thanksgiving!**	*Unit!*
14 Nov 27	Read *Teach Like Your Hair's on Fire*	
Nov 29	Read *Teach Like Your Hair's on Fire*	Groups report out
15 Dec 4	Mathematics, maps, & mountains using Excel	materials
Dec 6	Mathematics Community: Environment, Manipulatives, Classroom management & Cost	**Units Due Dec 4th!** Catalogs, websites
Finals	Final/closure Time Section 1	Tues 11 Dec 8-10am
week	Final/closure Time Section 2	Tues 11 Dec 1-3pm